

Supplemental Modeling to Compare Carbon Monoxide Emission Rates under the California Enhanced Inspection and Maintenance Program to the Federal Alternate Low Enhanced I/M Performance Standard

In response to a request from the U.S. Environmental Protection Agency (U.S. EPA), and pursuant to federal regulations at 40 CFR 51.351(d), California Air Resources Board (ARB) staff conducted modeling to compare carbon monoxide emission rates resulting from implementation of the California Enhanced Inspection and Maintenance (I/M) Program in the South Coast Air Basin to a federal performance benchmark, as well as to default emissions rates in the absence of an I/M program. ARB staff used U.S. EPA's MOBILE6.2 emissions model to compare three cases:

- The California Enhanced I/M Program
- The Alternate Low-Enhanced I/M Performance Standard baseline
- A No-I/M case

Note that California's official emissions inventory is developed using the State's EMFAC emissions model. The MOBILE6.2 model was used in this case to facilitate expeditious final action on the Carbon Monoxide Redesignation Request and Maintenance Plan for the South Coast Air Basin, due to the relative ease of altering the required inputs for purposes of comparing emissions rates. MOBILE6.2 was not used to develop an emissions inventory or tons-per-day emission reductions from the various I/M programs. EMFAC was the source for many of the inputs used in the MOBILE6.2 model runs, however.

Model Inputs

The calendar year analyzed was the carbon monoxide attainment year, 2002. ARB staff used South Coast Air Basin-specific vehicle registration information, including distributions by vehicle class and age and diesel registration fractions, from the EMFAC2002 (version 2.2, April 2003) emissions model. Other region-specific inputs from EMFAC2002 were hourly temperature and humidity profiles and Reid Vapor Pressure for the winter season.

ARB staff used the following table to convert vehicle class-specific inputs from EMFAC2002 to MOBILE6.2. Staff consulted the MOBILE6.2 User's Guide (<http://www.epa.gov/OMS/models/mobile6/420r03010.pdf>, p. 242) and assigned corresponding EMFAC2002 vehicle classifications to the MOBILE6.2 vehicle classes.

MOBILE Vehicle Class	EMFAC Vehicle Class
<i>LDV</i>	<i>Passenger Cars</i>
<i>LDT1</i>	<i>T1 (0-3750 lbs.)</i>
<i>LDT2</i>	<i>T2 (3751-5750 lbs.)</i>
<i>LDT3</i>	<i>T3 (5751-8500 lbs.)</i>
<i>LDT4</i>	<i>T3 (5751-8500 lbs.)</i>
<i>HDV2B</i>	<i>T4 (8501-10,000 lbs.)</i>
<i>HDV3</i>	<i>T5 (10,001-14,000 lbs.)</i>
<i>HDV4</i>	<i>T6 (14,001-33,000 lbs.)</i>
<i>HDV5</i>	<i>T6 (14,001-33,000 lbs.)</i>
<i>HDV6</i>	<i>T6 (14,001-33,000 lbs.)</i>
<i>HDV7</i>	<i>T6 (14,001-33,000 lbs.)</i>
<i>HDV8A</i>	<i>T7 (>33,000 lbs.)</i>
<i>HDV8B</i>	<i>T7 (>33,000 lbs.)</i>
<i>HDBS</i>	<i>School Buses</i>
<i>HDBT</i>	<i>Urban Buses</i>
<i>MC</i>	<i>Motorcycles</i>

Other inputs required for MOBILE6.2 were obtained from statewide statistics provided by the Bureau of Automotive Repair:

- ✓ The anti-tampering compliance rate refers to the portion of vehicles passing visual inspections in 2002.
- ✓ I/M stringency is the failure rate for pre-1981 vehicles. Statewide pre-1981 model year failure rates were estimated using BAR information for light- and heavy-duty vehicles.
- ✓ I/M compliance is the percentage of the covered fleet either complying or receiving a waiver. It was estimated by dividing total certifications issued (number of vehicles receive a certificate of passing or a waiver) by the total number of vehicles tested.
- ✓ Waiver rate was estimated by dividing the number of waivers issued by the total number of vehicles tested for the calendar year 2002. The same rate was used both for pre-1981 and 1981 and newer vehicles since this information was not distinguished by model year.

Input file commands for the MOBILE6.2 model are described in the User's Guide (<http://www.epa.gov/OMS/models/mobile6/420r03010.pdf>, pp. 129-148).

Input data for the Alternate Low Enhanced I/M Performance Standard baseline run were provided by the U.S. EPA Office of Transportation and Air Quality.

Results and Conclusion

A comparison of results from the MOBILE6.2 model runs is shown below. Input and output files are included as attachments to this document.

<i>South Coast Air Basin, Calendar Year 2002, Winter Season</i>			
<i>Composite Emissions Rate (grams/mile)</i>			
	No I/M	Baseline	South Coast Program
Carbon Monoxide	21.481	19.034	17.193

The results indicate that the Enhanced Inspection and Maintenance Program currently implemented in the South Coast Air Basin has resulted in composite winter season emissions rates about 10 percent below the Alternate Low-Enhanced I/M performance standard baseline, and about 20 percent below the No-I/M scenario.

Attachment A

Inputs Files and South Coast Vehicle Registration Distribution

MOBILE6 INPUT FILE

REPORT FILE : Baseline.out
DATABASE OUTPUT :
WITH FIELDNAMES :
EMISSIONS TABLE : Baseline.tbl
POLLUTANTS : HC NOX CO
RUN DATA

EXPAND EXHAUST :
EXPRESS HC AS THC :
HOURLY TEMPERATURES: 51.7 52.7 56.7 62.1 66.7 69.9 72.0 72.6 72.7 72.0
69.8 66.1 62.3 59.9 58.5 57.4 56.5 56.0 54.7 53.7 53.3 52.8 52.2 51.9
REG DISTRIBUTION : RegSC.d
FUEL RVP : 9.7

*!!!!!!Anti-temparing below*****

ANTI-TAMP PROG :
95 68 50 22222 11111111 1 11 096. 11112111
**95 = first year of the anti-tampering program
**68 = earliest model year in the program
**50= final model year (2050)
**22222 = light duty gas included
**11111111 = heavy duty gas NOT included
**1 = gas bus not included
**1 = has to be there
**1 = annual frequency
**0.96 = Compliance rate
**11112111 =which test is applied (list @ users' manual pg. 131)

I/M PROGRAM : 1 1983 2050 1 T/O IDLE
I/M MODEL YEARS : 1 1968 2050
I/M VEHICLES : 1 22222 11111111 2
I/M STRINGENCY : 1 20.0
I/M COMPLIANCE : 1 96.0
I/M WAIVER RATES : 1 3.03.0
NO I/M TTC CREDITS : 1

SCENARIO RECORD : Baseline
CALENDAR YEAR : 2002
EVALUATION MONTH : 1
RELATIVE HUMIDITY : 53.0 50.7 41.6 31.4 25.5 22.1 20.6 19.9 20.8 22.5
29.4 36.7
43.0 46.5 49.7 52.3 53.6 55.1 48.8 49.3 50.0 51.2 52.2 52.2

DIESEL FRACTIONS :
0.0010 0.0015 0.0002 0.0004 0.0005 0.0006 0.0004 0.0004 0.0006 0.0076
0.0046 0.0227 0.0351 0.0666 0.0986 0.1135 0.1056 0.0911 0.0482 0.0359
0.0327 0.0304 0.0060 0.0038 0.0036
0.0330 0.0300 0.0148 0.0166 0.0132 0.0128 0.0153 0.0142 0.0111 0.0153
0.0204 0.0280 0.0361 0.0469 0.0588 0.0468 0.0182 0.0028 0.0032 0.0015

0.0009 0.0021 0.0022 0.0008 0.0005
 0.0025 0.0037 0.0026 0.0023 0.0026 0.0030 0.0054 0.0047 0.0037 0.0071
 0.0116 0.0198 0.0403 0.0754 0.1144 0.0236 0.0473 0.0286 0.0131 0.0039
 0.0045 0.0044 0.0031 0.0029 0.0024
 0.0067 0.0097 0.0113 0.0036 0.0064 0.0070 0.0129 0.0039 0.0065 0.0075
 0.0083 0.0126 0.0216 0.0402 0.1016 0.0188 0.0256 0.0163 0.0072 0.0035
 0.0023 0.0031 0.0028 0.0011 0.0013
 0.0067 0.0097 0.0113 0.0036 0.0064 0.0070 0.0129 0.0039 0.0065 0.0075
 0.0083 0.0126 0.0216 0.0402 0.1016 0.0188 0.0256 0.0163 0.0072 0.0035
 0.0023 0.0031 0.0028 0.0011 0.0013
 0.0863 0.1077 0.0780 0.0406 0.0457 0.0723 0.0964 0.0892 0.0501 0.0514
 0.0801 0.0791 0.0785 0.0861 0.0917 0.0832 0.1393 0.0790 0.0707 0.0756
 0.0657 0.0920 0.0835 0.0484 0.0631
 0.3443 0.2746 0.3590 0.4377 0.5244 0.4427 0.4583 0.4877 0.4587 0.3444
 0.4293 0.2380 0.4024 0.1969 0.0660 0.0092 0.0000 0.0076 0.0000 0.0000
 0.0000 0.0000 0.0000 0.0000 0.0000
 0.8715 0.8130 0.8062 0.7806 0.7530 0.7266 0.7302 0.6847 0.7354 0.7352
 0.6836 0.6022 0.6445 0.5948 0.5456 0.5532 0.5038 0.4084 0.3370 0.2269
 0.1635 0.1693 0.1651 0.1183 0.1174
 0.8715 0.8130 0.8062 0.7806 0.7530 0.7266 0.7302 0.6847 0.7354 0.7352
 0.6836 0.6022 0.6445 0.5948 0.5456 0.5532 0.5038 0.4084 0.3370 0.2269
 0.1635 0.1693 0.1651 0.1183 0.1174
 0.6300 0.6078 0.5246 0.5767 0.5289 0.5788 0.5617 0.4537 0.4216 0.4734
 0.4705 0.4525 0.4310 0.3569 0.3690 0.4413 0.3094 0.1679 0.1390 0.0808
 0.0476 0.0365 0.0288 0.0274 0.0297
 0.8715 0.8130 0.8062 0.7806 0.7530 0.7266 0.7302 0.6847 0.7354 0.7352
 0.6836 0.6022 0.6445 0.5948 0.5456 0.5532 0.5038 0.4084 0.3370 0.2269
 0.1635 0.1693 0.1651 0.1183 0.1174
 0.8715 0.8130 0.8062 0.7806 0.7530 0.7266 0.7302 0.6847 0.7354 0.7352
 0.6836 0.6022 0.6445 0.5948 0.5456 0.5532 0.5038 0.4084 0.3370 0.2269
 0.1635 0.1693 0.1651 0.1183 0.1174
 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000
 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000
 1.0000 1.0000 1.0000 1.0000 1.0000
 0.8715 0.8130 0.8062 0.7806 0.7530 0.7266 0.7302 0.6847 0.7354 0.7352
 0.6836 0.6022 0.6445 0.5948 0.5456 0.5532 0.5038 0.4084 0.3370 0.2269
 0.1635 0.1693 0.1651 0.1183 0.1174

END OF RUN :

MOBILE6 INPUT FILE

REPORT FILE : None.out
 DATABASE OUTPUT :
 WITH FIELDNAMES :
 EMISSIONS TABLE : None.tbl
 POLLUTANTS : HC NOX CO
 RUN DATA

EXPAND EXHAUST :
 EXPRESS HC AS THC :
 HOURLY TEMPERATURES: 51.7 52.7 56.7 62.1 66.7 69.9 72.0 72.6 72.7 72.0
 69.8 66.1 62.3 59.9 58.5 57.4 56.5 56.0 54.7 53.7 53.3 52.8 52.2 51.9
 REG DISTRIBUTION : RegSC.d

FUEL RVP : 9.7
SCENARIO RECORD : SC
CALENDAR YEAR : 2002
EVALUATION MONTH : 1
RELATIVE HUMIDITY : 53.0 50.7 41.6 31.4 25.5 22.1 20.6 19.9 20.8 22.5
29.4 36.7 43.0 46.5 49.7 52.3 53.6 55.1 48.8 49.3 50.0 51.2 52.2 52.2

DIESEL FRACTIONS :

0.0010	0.0015	0.0002	0.0004	0.0005	0.0006	0.0004	0.0004	0.0006	0.0076
0.0046	0.0227	0.0351	0.0666	0.0986	0.1135	0.1056	0.0911	0.0482	0.0359
0.0327	0.0304	0.0060	0.0038	0.0036					
0.0330	0.0300	0.0148	0.0166	0.0132	0.0128	0.0153	0.0142	0.0111	0.0153
0.0204	0.0280	0.0361	0.0469	0.0588	0.0468	0.0182	0.0028	0.0032	0.0015
0.0009	0.0021	0.0022	0.0008	0.0005					
0.0025	0.0037	0.0026	0.0023	0.0026	0.0030	0.0054	0.0047	0.0037	0.0071
0.0116	0.0198	0.0403	0.0754	0.1144	0.0236	0.0473	0.0286	0.0131	0.0039
0.0045	0.0044	0.0031	0.0029	0.0024					
0.0067	0.0097	0.0113	0.0036	0.0064	0.0070	0.0129	0.0039	0.0065	0.0075
0.0083	0.0126	0.0216	0.0402	0.1016	0.0188	0.0256	0.0163	0.0072	0.0035
0.0023	0.0031	0.0028	0.0011	0.0013					
0.0067	0.0097	0.0113	0.0036	0.0064	0.0070	0.0129	0.0039	0.0065	0.0075
0.0083	0.0126	0.0216	0.0402	0.1016	0.0188	0.0256	0.0163	0.0072	0.0035
0.0023	0.0031	0.0028	0.0011	0.0013					
0.0863	0.1077	0.0780	0.0406	0.0457	0.0723	0.0964	0.0892	0.0501	0.0514
0.0801	0.0791	0.0785	0.0861	0.0917	0.0832	0.1393	0.0790	0.0707	0.0756
0.0657	0.0920	0.0835	0.0484	0.0631					
0.3443	0.2746	0.3590	0.4377	0.5244	0.4427	0.4583	0.4877	0.4587	0.3444
0.4293	0.2380	0.4024	0.1969	0.0660	0.0092	0.0000	0.0076	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000					
0.8715	0.8130	0.8062	0.7806	0.7530	0.7266	0.7302	0.6847	0.7354	0.7352
0.6836	0.6022	0.6445	0.5948	0.5456	0.5532	0.5038	0.4084	0.3370	0.2269
0.1635	0.1693	0.1651	0.1183	0.1174					
0.8715	0.8130	0.8062	0.7806	0.7530	0.7266	0.7302	0.6847	0.7354	0.7352
0.6836	0.6022	0.6445	0.5948	0.5456	0.5532	0.5038	0.4084	0.3370	0.2269
0.1635	0.1693	0.1651	0.1183	0.1174					
0.6300	0.6078	0.5246	0.5767	0.5289	0.5788	0.5617	0.4537	0.4216	0.4734
0.4705	0.4525	0.4310	0.3569	0.3690	0.4413	0.3094	0.1679	0.1390	0.0808
0.0476	0.0365	0.0288	0.0274	0.0297					
0.8715	0.8130	0.8062	0.7806	0.7530	0.7266	0.7302	0.6847	0.7354	0.7352
0.6836	0.6022	0.6445	0.5948	0.5456	0.5532	0.5038	0.4084	0.3370	0.2269
0.1635	0.1693	0.1651	0.1183	0.1174					
0.8715	0.8130	0.8062	0.7806	0.7530	0.7266	0.7302	0.6847	0.7354	0.7352
0.6836	0.6022	0.6445	0.5948	0.5456	0.5532	0.5038	0.4084	0.3370	0.2269
0.1635	0.1693	0.1651	0.1183	0.1174					
1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1.0000	1.0000	1.0000	1.0000	1.0000					
0.8715	0.8130	0.8062	0.7806	0.7530	0.7266	0.7302	0.6847	0.7354	0.7352
0.6836	0.6022	0.6445	0.5948	0.5456	0.5532	0.5038	0.4084	0.3370	0.2269
0.1635	0.1693	0.1651	0.1183	0.1174					

END OF RUN :

MOBILE6 INPUT FILE

REPORT FILE : SCv4.out
DATABASE OUTPUT :
WITH FIELDNAMES :
EMISSIONS TABLE : SCv4.tbl
POLLUTANTS : HC NOX CO
RUN DATA

EXPAND EXHAUST :
EXPRESS HC AS THC :
HOURLY TEMPERATURES: 51.7 52.7 56.7 62.1 66.7 69.9 72.0 72.6 72.7 72.0
69.8 66.1
62.3 59.9 58.5 57.4 56.5 56.0 54.7 53.7 53.3 52.8 52.2 51.9
REG DISTRIBUTION : RegSC.d
***Above RegSC.d is the modified reg dist
FUEL RVP : 9.7

ANTI-TAMP PROG :
74 73 50 22222 22222222 1 12 098. 22212222

**LDV I/M programs below:
I/M PROGRAM : 1 1984 2050 2 TRC ASM 2525/5015 FINAL
I/M PROGRAM : 2 1998 2050 2 TRC EVAP OBD & GC
**HDV I/M programs below:
I/M PROGRAM : 3 1984 2050 2 TRC 2500/IDLE
I/M PROGRAM : 4 1998 2050 2 TRC GC

I/M MODEL YEARS : 1 1973 2050
I/M MODEL YEARS : 2 1973 2050
I/M MODEL YEARS : 3 1973 2050
I/M MODEL YEARS : 4 1973 2050

I/M VEHICLES : 1 22222 11111111 1
I/M VEHICLES : 2 22222 11111111 1
I/M VEHICLES : 3 11111 22222222 2
I/M VEHICLES : 4 11111 22222222 2

I/M STRINGENCY : 1 30.5
I/M STRINGENCY : 3 30.5

*
I/M COMPLIANCE : 1 97.0
I/M COMPLIANCE : 2 97.0
I/M COMPLIANCE : 3 97.0
I/M COMPLIANCE : 4 97.0

**

I/M WAIVER RATES : 1 0.01 0.01
I/M WAIVER RATES : 2 0.01 0.01
I/M WAIVER RATES : 3 0.01 0.01
I/M WAIVER RATES : 4 0.01 0.01

*

I/M GRACE PERIOD : 1 4
I/M GRACE PERIOD : 2 4
I/M GRACE PERIOD : 3 4
I/M GRACE PERIOD : 4 4

*

SCENARIO RECORD : SC
CALENDAR YEAR : 2002
EVALUATION MONTH : 1
RELATIVE HUMIDITY : 53.0 50.7 41.6 31.4 25.5 22.1 20.6 19.9 20.8 22.5
29.4 36.7
43.0 46.5 49.7 52.3 53.6 55.1 48.8 49.3 50.0 51.2 52.2 52.2

DIESEL FRACTIONS :
0.0010 0.0015 0.0002 0.0004 0.0005 0.0006 0.0004 0.0004 0.0006 0.0076
0.0046 0.0227 0.0351 0.0666 0.0986 0.1135 0.1056 0.0911 0.0482 0.0359
0.0327 0.0304 0.0060 0.0038 0.0036
0.0330 0.0300 0.0148 0.0166 0.0132 0.0128 0.0153 0.0142 0.0111 0.0153
0.0204 0.0280 0.0361 0.0469 0.0588 0.0468 0.0182 0.0028 0.0032 0.0015
0.0009 0.0021 0.0022 0.0008 0.0005
0.0025 0.0037 0.0026 0.0023 0.0026 0.0030 0.0054 0.0047 0.0037 0.0071
0.0116 0.0198 0.0403 0.0754 0.1144 0.0236 0.0473 0.0286 0.0131 0.0039
0.0045 0.0044 0.0031 0.0029 0.0024
0.0067 0.0097 0.0113 0.0036 0.0064 0.0070 0.0129 0.0039 0.0065 0.0075
0.0083 0.0126 0.0216 0.0402 0.1016 0.0188 0.0256 0.0163 0.0072 0.0035
0.0023 0.0031 0.0028 0.0011 0.0013
0.0067 0.0097 0.0113 0.0036 0.0064 0.0070 0.0129 0.0039 0.0065 0.0075
0.0083 0.0126 0.0216 0.0402 0.1016 0.0188 0.0256 0.0163 0.0072 0.0035
0.0023 0.0031 0.0028 0.0011 0.0013
0.0863 0.1077 0.0780 0.0406 0.0457 0.0723 0.0964 0.0892 0.0501 0.0514
0.0801 0.0791 0.0785 0.0861 0.0917 0.0832 0.1393 0.0790 0.0707 0.0756
0.0657 0.0920 0.0835 0.0484 0.0631
0.3443 0.2746 0.3590 0.4377 0.5244 0.4427 0.4583 0.4877 0.4587 0.3444
0.4293 0.2380 0.4024 0.1969 0.0660 0.0092 0.0000 0.0076 0.0000 0.0000
0.0000 0.0000 0.0000 0.0000 0.0000
0.8715 0.8130 0.8062 0.7806 0.7530 0.7266 0.7302 0.6847 0.7354 0.7352
0.6836 0.6022 0.6445 0.5948 0.5456 0.5532 0.5038 0.4084 0.3370 0.2269
0.1635 0.1693 0.1651 0.1183 0.1174
0.8715 0.8130 0.8062 0.7806 0.7530 0.7266 0.7302 0.6847 0.7354 0.7352
0.6836 0.6022 0.6445 0.5948 0.5456 0.5532 0.5038 0.4084 0.3370 0.2269
0.1635 0.1693 0.1651 0.1183 0.1174
0.6300 0.6078 0.5246 0.5767 0.5289 0.5788 0.5617 0.4537 0.4216 0.4734
0.4705 0.4525 0.4310 0.3569 0.3690 0.4413 0.3094 0.1679 0.1390 0.0808
0.0476 0.0365 0.0288 0.0274 0.0297

```

0.8715 0.8130 0.8062 0.7806 0.7530 0.7266 0.7302 0.6847 0.7354 0.7352
0.6836 0.6022 0.6445 0.5948 0.5456 0.5532 0.5038 0.4084 0.3370 0.2269
0.1635 0.1693 0.1651 0.1183 0.1174
0.8715 0.8130 0.8062 0.7806 0.7530 0.7266 0.7302 0.6847 0.7354 0.7352
0.6836 0.6022 0.6445 0.5948 0.5456 0.5532 0.5038 0.4084 0.3370 0.2269
0.1635 0.1693 0.1651 0.1183 0.1174
1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000
1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000
1.0000 1.0000 1.0000 1.0000 1.0000
0.8715 0.8130 0.8062 0.7806 0.7530 0.7266 0.7302 0.6847 0.7354 0.7352
0.6836 0.6022 0.6445 0.5948 0.5456 0.5532 0.5038 0.4084 0.3370 0.2269
0.1635 0.1693 0.1651 0.1183 0.1174

```

END OF RUN :

REG DIST

```

*
* This file contains the default MOBILE6 values for the distribution
of
* vehicles by age for July of any calendar year. There are sixteen
(16)
* sets of values representing 16 combined gasoline/diesel vehicle
class
* distributions. These distributions are split for gasoline and
diesel
* using the separate input (or default) values for diesel sales
fractions.
* Each distribution contains 25 values which represent the fraction of
* all vehicles in that class (gasoline and diesel) of that age in
July.
* The first number is for age 1 (calendar year minus model year plus
one)
* and the last number is for age 25. The last age includes all
vehicles
* of age 25 or older. The first number in each distribution is an
integer
* which indicates which of the 16 vehicle classes are represented by
the
* distribution. The sixteen vehicle classes are:
*
* 1 LDV Light-Duty Vehicles (Passenger Cars)
* 2 LDT1 Light-Duty Trucks 1 (0-6,000 lbs. GVWR, 0-3750 lbs. LVW)
* 3 LDT2 Light Duty Trucks 2 (0-6,001 lbs. GVWR, 3751-5750 lbs.
LVW)
* 4 LDT3 Light Duty Trucks 3 (6,001-8500 lbs. GVWR, 0-3750 lbs.
LVW)
* 5 LDT4 Light Duty Trucks 4 (6,001-8500 lbs. GVWR, 3751-5750 lbs.
LVW)
* 6 HDV2B Class 2b Heavy Duty Vehicles (8501-10,000 lbs. GVWR)
* 7 HDV3 Class 3 Heavy Duty Vehicles (10,001-14,000 lbs. GVWR)
* 8 HDV4 Class 4 Heavy Duty Vehicles (14,001-16,000 lbs. GVWR)
* 9 HDV5 Class 5 Heavy Duty Vehicles (16,001-19,500 lbs. GVWR)
* 10 HDV6 Class 6 Heavy Duty Vehicles (19,501-26,000 lbs. GVWR)
* 11 HDV7 Class 7 Heavy Duty Vehicles (26,001-33,000 lbs. GVWR)
* 12 HDV8A Class 8a Heavy Duty Vehicles (33,001-60,000 lbs. GVWR)

```

```

* 13 HDV8B Class 8b Heavy Duty Vehicles (>60,000 lbs. GVWR)
* 14 HDBS School Busses
* 15 HDBT Transit and Urban Busses
* 16 MC Motorcycles (All)
*
* The 25 age values are arranged in two rows of 10 values followed by
a row
* with the last 5 values. Comments (such as this one) are indicated
by
* an asterisk in the first column. Empty rows are ignored. Values are
* read "free format," meaning any number may appear in any row with as
* many characters as needed (including a decimal) as long as 25 values
* follow the initial integer value separated by a space.
*
* If all 28 vehicle classes do not need to be altered from the default
* values, then only the vehicle classes that need to be changed need
to
* be included in this file. The order in which the vehicle classes
are
* read does not matter, however each vehicle class set must contain 25
* values and be in the proper age order.
*****ALTERED FOR SCAB by Mimi Sogutlugil*****
* LDV
1 0.062 0.061 0.064 0.067 0.060 0.058 0.051 0.059 0.050 0.048
0.043 0.048 0.048 0.049 0.041 0.038 0.029 0.024 0.018 0.011
0.009 0.007 0.005 0.006 0.0411
* LDT1
2 0.056 0.059 0.061 0.059 0.056 0.062 0.047 0.052 0.056 0.044
0.036 0.040 0.040 0.049 0.044 0.038 0.042 0.028 0.022 0.012
0.011 0.008 0.007 0.008 0.0621
* LDT2
3 0.091 0.096 0.097 0.097 0.079 0.066 0.053 0.063 0.050 0.047
0.038 0.036 0.029 0.027 0.020 0.018 0.017 0.012 0.008 0.004
0.004 0.004 0.003 0.006 0.0351
* LDT3
4 0.074 0.079 0.083 0.085 0.065 0.063 0.055 0.054 0.044 0.046
0.028 0.036 0.035 0.044 0.035 0.035 0.030 0.029 0.021 0.010
0.006 0.005 0.004 0.005 0.0281
* LDT4
5 0.074 0.079 0.083 0.085 0.065 0.063 0.055 0.054 0.044 0.046
0.028 0.036 0.035 0.044 0.035 0.035 0.030 0.029 0.021 0.010
0.006 0.005 0.004 0.005 0.0281
* HDV2B
6 0.145 0.144 0.140 0.141 0.072 0.016 0.009 0.012 0.009 0.011
0.010 0.012 0.015 0.019 0.029 0.026 0.019 0.019 0.020 0.010
0.008 0.007 0.009 0.011 0.0861
* HDV3
7 0.090 0.095 0.097 0.099 0.043 0.056 0.047 0.054 0.055 0.042
0.031 0.035 0.055 0.048 0.035 0.036 0.036 0.016 0.010 0.004
0.003 0.003 0.000 0.004 0.0041
* HDV4
8 0.068 0.073 0.078 0.083 0.051 0.055 0.047 0.064 0.034 0.030
0.030 0.036 0.048 0.039 0.032 0.030 0.023 0.023 0.019 0.007
0.008 0.011 0.010 0.014 0.0871
* HDV5
9 0.068 0.073 0.078 0.083 0.051 0.055 0.047 0.064 0.034 0.030
0.030 0.036 0.048 0.039 0.032 0.030 0.023 0.023 0.019 0.007

```

	0.008	0.011	0.010	0.014	0.0871					
	* HDV6									
10	0.068	0.073	0.078	0.083	0.051	0.055	0.047	0.064	0.034	0.030
	0.030	0.036	0.048	0.039	0.032	0.030	0.023	0.023	0.019	0.007
	0.008	0.011	0.010	0.014	0.0871					
	* HDV7									
11	0.068	0.073	0.078	0.083	0.051	0.055	0.047	0.064	0.034	0.030
	0.030	0.036	0.048	0.039	0.032	0.030	0.023	0.023	0.019	0.007
	0.008	0.011	0.010	0.014	0.0871					
	* HDV8a									
12	0.039	0.036	0.033	0.042	0.035	0.030	0.043	0.059	0.053	0.048
	0.044	0.053	0.061	0.074	0.061	0.053	0.046	0.038	0.031	0.011
	0.012	0.013	0.010	0.011	0.0611					
	* HDV8b									
13	0.039	0.036	0.033	0.042	0.035	0.030	0.043	0.059	0.053	0.048
	0.044	0.053	0.061	0.074	0.061	0.053	0.046	0.038	0.031	0.011
	0.012	0.013	0.010	0.011	0.0611					
	* HDBS									
14	0.039	0.036	0.033	0.042	0.035	0.030	0.043	0.059	0.053	0.048
	0.044	0.053	0.061	0.074	0.061	0.053	0.046	0.038	0.031	0.011
	0.012	0.013	0.010	0.011	0.0611					
	* HDBT									
15	0.039	0.036	0.033	0.042	0.035	0.030	0.043	0.059	0.053	0.048
	0.044	0.053	0.061	0.074	0.061	0.053	0.046	0.038	0.031	0.011
	0.012	0.013	0.010	0.011	0.0611					
	* Motorcycles									
16	0.1440	0.1680	0.1350	0.1090	0.0880	0.0700	0.0560	0.0450	0.0360	
	0.0290	0.0230	0.0970	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				

Attachment B

MOBILE6.2 Output Files

* MOBILE6.2.03 (24-Sep-2003) *
* Input file: BASELINE.IN (file 1, run 1). *

* Reading Registration Distributions from the following external
* data file: REGSC.D

- M 49 Warning:
0.997 MYR sum not = 1. (will normalize)
- M 49 Warning:
0.999 MYR sum not = 1. (will normalize)
- M 49 Warning:
1.00 MYR sum not = 1. (will normalize)
- M 49 Warning:
0.999 MYR sum not = 1. (will normalize)
- M 49 Warning:
0.999 MYR sum not = 1. (will normalize)
- M 49 Warning:
0.999 MYR sum not = 1. (will normalize)
- M 49 Warning:
0.998 MYR sum not = 1. (will normalize)
- M 49 Warning:
1.00 MYR sum not = 1. (will normalize)
- M 49 Warning:
1.00 MYR sum not = 1. (will normalize)
- M 49 Warning:
1.00 MYR sum not = 1. (will normalize)
- M 49 Warning:
1.00 MYR sum not = 1. (will normalize)
- M 49 Warning:
0.997 MYR sum not = 1. (will normalize)
- M 49 Warning:
0.997 MYR sum not = 1. (will normalize)
- M 49 Warning:
0.997 MYR sum not = 1. (will normalize)
- M 49 Warning:
0.997 MYR sum not = 1. (will normalize)

* #####

* Baseline

* File 1, Run 1, Scenario 1.

* #####

M614 Comment:

User supplied diesel sale fractions.

*** I/M credits for Tech1&2 vehicles were read from the following external
data file: TECH12.D

M 48 Warning:

there are no sales for vehicle class HDGV8b

Calendar Year: 2002

Month: Jan.

Altitude: Low
 Minimum Temperature: 51.7 (F)
 Maximum Temperature: 72.7 (F)
 Minimum Rel. Hum.: 19.9 (%)
 Maximum Rel. Hum.: 55.1 (%)
 Nominal Fuel RVP: 9.7 psi
 Weathered RVP: 9.7 psi
 Fuel Sulfur Content: 279. ppm

Exhaust I/M Program: Yes
 Evap I/M Program: No
 ATP Program: Yes
 Reformulated Gas: No

Vehicle Type: LDGV LDGT12 LDGT34 LDGT HDGV LDDV LDDT HDDV
 MC All Veh

GVWR: <6000 >6000 (All)

 VMT Distribution: 0.4403 0.3120 0.1153 0.0477 0.0077 0.0051 0.0657
 0.0061 1.0000

 Composite Emission Factors (g/mi):
 Composite THC : 2.023 1.829 2.241 1.940 2.265 0.686 0.751 0.801
 2.22 1.903
 Composite CO : 18.62 20.94 24.06 21.78 23.61 1.635 1.378 4.503
 13.88 19.034
 Composite NOx : 1.570 1.527 1.815 1.605 4.928 1.493 1.397 17.192
 1.59 2.771

 Exhaust emissions (g/mi):
 THC Start: 0.531 0.469 0.543 0.489 0.252 0.257 0.423
 THC Running: 0.521 0.635 0.813 0.683 0.434 0.494 1.347
 THC Total Exhaust: 1.052 1.104 1.356 1.172 1.049 0.686 0.751 0.801
 1.77 1.087

CO Start: 7.04 8.25 8.76 8.39 0.741 0.568 3.359
 CO Running: 11.58 12.70 15.30 13.40 0.894 0.810 10.523
 CO Total Exhaust: 18.62 20.94 24.06 21.78 23.61 1.635 1.378 4.503
 13.88 19.034

NOx Start: 0.408 0.319 0.342 0.325 0.064 0.052 0.497
 NOx Running: 1.162 1.208 1.474 1.280 1.428 1.345 1.089
 NOx Total Exhaust: 1.570 1.527 1.815 1.605 4.928 1.493 1.397 17.192
 1.59 2.771

 ~
 ~

 * MOBILE6.2.03 (24-Sep-2003) *
 * Input file: NONE.IN (file 1, run 1). *

* Reading Registration Distributions from the following external
* data file: REGSC.D

M 49 Warning:
0.997 MYR sum not = 1. (will normalize)
M 49 Warning:
0.999 MYR sum not = 1. (will normalize)
M 49 Warning:
1.00 MYR sum not = 1. (will normalize)
M 49 Warning:
0.999 MYR sum not = 1. (will normalize)
M 49 Warning:
0.999 MYR sum not = 1. (will normalize)
M 49 Warning:
0.999 MYR sum not = 1. (will normalize)
M 49 Warning:
0.999 MYR sum not = 1. (will normalize)
M 49 Warning:
0.998 MYR sum not = 1. (will normalize)
M 49 Warning:
1.00 MYR sum not = 1. (will normalize)
M 49 Warning:
1.00 MYR sum not = 1. (will normalize)
M 49 Warning:
1.00 MYR sum not = 1. (will normalize)
M 49 Warning:
1.00 MYR sum not = 1. (will normalize)
M 49 Warning:
0.997 MYR sum not = 1. (will normalize)
M 49 Warning:
0.997 MYR sum not = 1. (will normalize)
M 49 Warning:
0.997 MYR sum not = 1. (will normalize)
M 49 Warning:
0.997 MYR sum not = 1. (will normalize)

* #####

* SC

* File 1, Run 1, Scenario 1.

* #####

M614 Comment:

User supplied diesel sale fractions.

M 48 Warning:

there are no sales for vehicle class HDGV8b

Calendar Year: 2002

Month: Jan.

Altitude: Low

Minimum Temperature: 51.7 (F)

Maximum Temperature: 72.7 (F)

Minimum Rel. Hum.: 19.9 (%)

Maximum Rel. Hum.: 55.1 (%)

Nominal Fuel RVP: 9.7 psi

Weathered RVP: 9.7 psi

Fuel Sulfur Content: 279. ppm

Exhaust I/M Program: No

Evap I/M Program: No

ATP Program: No

Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDLT
HDDV	MC	All Veh					
GVWR:	<6000	>6000	(All)				
VMT Distribution:	0.4403	0.3120	0.1153	0.0477	0.0077	0.0051	0.0657
	0.0061	1.0000					

Composite Emission Factors (g/mi):
Composite THC : 2.279 1.975 2.346 2.075 2.271 0.686 0.751 0.801
2.22 2.074
Composite CO : 22.06 23.01 26.48 23.95 23.79 1.635 1.378 4.503
13.88 21.481
Composite NOX : 1.604 1.567 1.866 1.648 4.929 1.493 1.397 17.192
1.59 2.804

Exhaust emissions (g/mi):
THC Start: 0.662 0.563 0.599 0.572 0.252 0.257 0.423
THC Running: 0.645 0.688 0.861 0.735 0.434 0.494 1.347
THC Total Exhaust: 1.308 1.250 1.461 1.307 1.055 0.686 0.751 0.801
1.77 1.257

CO Start: 8.34 9.45 10.13 9.63 0.741 0.568 3.359
CO Running: 13.72 13.56 16.35 14.31 0.894 0.810 10.523
CO Total Exhaust: 22.06 23.01 26.48 23.95 23.79 1.635 1.378 4.503
13.88 21.481

NOx Start: 0.408 0.319 0.342 0.325 0.064 0.052 0.497
NOx Running: 1.196 1.248 1.524 1.322 1.428 1.345 1.089
NOx Total Exhaust: 1.604 1.567 1.866 1.648 4.929 1.493 1.397 17.192
1.59 2.804

* MOBILE6.2.03 (24-Sep-2003) *
* Input file: SC_V4.IN (file 1, run 1). *

* Reading Registration Distributions from the following external
* data file: REGSC.D
M 49 Warning:
0.997 MYR sum not = 1. (will normalize)
M 49 Warning:
0.999 MYR sum not = 1. (will normalize)
M 49 Warning:
1.00 MYR sum not = 1. (will normalize)
M 49 Warning:
0.999 MYR sum not = 1. (will normalize)
M 49 Warning:
0.999 MYR sum not = 1. (will normalize)

M 49 Warning:
 0.999 MYR sum not = 1. (will normalize)
 M 49 Warning:
 0.998 MYR sum not = 1. (will normalize)
 M 49 Warning:
 1.00 MYR sum not = 1. (will normalize)
 M 49 Warning:
 1.00 MYR sum not = 1. (will normalize)
 M 49 Warning:
 1.00 MYR sum not = 1. (will normalize)
 M 49 Warning:
 1.00 MYR sum not = 1. (will normalize)
 M 49 Warning:
 1.00 MYR sum not = 1. (will normalize)
 M 49 Warning:
 0.997 MYR sum not = 1. (will normalize)
 M 49 Warning:
 0.997 MYR sum not = 1. (will normalize)
 M 49 Warning:
 0.997 MYR sum not = 1. (will normalize)
 M 49 Warning:
 0.997 MYR sum not = 1. (will normalize)

* Reading ASM I/M Test Credits from ASMDATA.D

* #####

* SC

* File 1, Run 1, Scenario 1.

* #####

M614 Comment:

User supplied diesel sale fractions.

*** I/M credits for Tech1&2 vehicles were read from the following external data file: TECH12.D

M 48 Warning:

there are no sales for vehicle class HDGV8b

Calendar Year: 2002

Month: Jan.

Altitude: Low

Minimum Temperature: 51.7 (F)

Maximum Temperature: 72.7 (F)

Minimum Rel. Hum.: 19.9 (%)

Maximum Rel. Hum.: 55.1 (%)

Nominal Fuel RVP: 9.7 psi

Weathered RVP: 9.7 psi

Fuel Sulfur Content: 279. ppm

Exhaust I/M Program: Yes

Evap I/M Program: Yes

ATP Program: Yes

Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT
HDDV	MC	All Veh					
	GVWR:	<6000	>6000	(All)			
		-----	-----	-----	-----	-----	-----
VMT Distribution:	0.4403	0.3120	0.1153		0.0477	0.0077	0.0051
	0.0061	1.0000					0.0657

Composite Emission Factors (g/mi):

Composite THC : 1.926 1.672 2.028 1.768 2.180 0.686 0.751 0.801
2.22 1.783

Composite CO : 16.82 18.91 21.24 19.54 21.76 1.635 1.378 4.503
13.88 17.193

Composite NOX : 1.385 1.404 1.685 1.480 4.899 1.493 1.397 17.192
1.59 2.634

Exhaust emissions (g/mi):

THC Start: 0.524 0.465 0.533 0.483 0.252 0.257 0.423

THC Running: 0.432 0.482 0.610 0.517 0.434 0.494 1.347

THC Total Exhaust: 0.956 0.947 1.143 1.000 0.982 0.686 0.751 0.801
1.77 0.967

CO Start: 6.99 8.06 8.43 8.16 0.741 0.568 3.359

CO Running: 9.83 10.85 12.82 11.38 0.894 0.810 10.523

CO Total Exhaust: 16.82 18.91 21.24 19.54 21.76 1.635 1.378 4.503
13.88 17.193

NOx Start: 0.408 0.319 0.342 0.325 0.064 0.052 0.497

NOx Running: 0.977 1.085 1.343 1.155 1.428 1.345 1.089

NOx Total Exhaust: 1.385 1.404 1.685 1.480 4.899 1.493 1.397 17.192
1.59 2.634
